

REMARKS

Applicants acknowledge with thanks that applicants' responses to the previous rejection under Section 103(a) have been fully considered and persuasive. The Office applies a new ground of rejection. Objections are made with respect to claim 1, and claim 1 has been amended in a manner that is believed to obviate these objections.

THE NEW §103 REJECTION:

Claims 1-5, 7, 9, 12, 13, 16-19, 21, 22 and 23 are rejected under 35 U.S.C. §103(a) from Rennen et al. EP 0344430 in view of Deleuil U.S. Patent No. 4,221,599.

Prima Facie Obviousness is Not Established**Summary:**

Claims 1 and 13 are distinguished from Rennen at least in that Rennen does not disclose calcium sulfate dihydrate particles having:

- a surface area of $0.1-0.3\text{m}^2/\text{g}$, and
- a particle size distribution within the range of 0.1-1000 microns.

The Office considers that it would have been obvious to combine

the teaching of Rennen and Deleuil to arrive at these features. Applicants disagree with the Office on three main points, which are summarized as follows.

Firstly, applicants respectfully disagree with the Examiner's assertion that Deleuil discloses calcium sulfate dihydrate particles having a particle size distribution within the range of 20-100 microns. From applicants' understanding of the disclosure of this document, this particle size distribution is only disclosed in relation to plaster particles, that is calcined gypsum particles. The particle size of dihydrate gypsum particles is not stated. Thus, it would simply not be possible for the skilled person referring to Rennen or Deleuil to arrive at the particle size distribution specified in claims 1 and 13.

Secondly, applicants respectfully maintain that neither Rennen nor Deleuil contain any teaching that would motivate the skilled person to modify Rennen to provide calcium sulfate dihydrate particles having the surface area specified in claims 1 and 13.

Thirdly, not addressed in the Office Action is that present claims 1 and 13 specify that "the calcium sulfate dihydrate DSG

particles comprise an inert particulate filler and thereby improve acoustic properties of the wallboard."

Therefore, even if it had been obvious to combine Rennen and Deleuil, not all of the features of claims 1 and 13, or the claims dependent thereon, would be present.

Specific comments on particle size:

Applicants disagree with the Examiner that Deleuil discloses a particle size distribution for dihydrate gypsum particles of 20-100 microns. This particle size is, in fact, disclosed in relation to the particles used in the plaster (for reference, the properties of the gypsum particles used by Deleuil are discussed in col. 3, line 25 to col. 4, line 30, while the section from col. 4, line 31 to col. 5, line 38 refers to the properties of the plaster). Thus, the paragraph that discloses the particle size of 20-100 microns goes on to say "such a grain size distribution is [...] characteristic of those plasters derived from the calcination of phosphogypsum" (see col. 4, lines 55-58).

To the best of applicants' understanding, Deleuil does not disclose any particle size distribution in relation to dihydrate gypsum particles, and thus there is no such teaching for the

skilled person to incorporate into Rennen.

In any case, applicants disagree with the Examiner's contention that Rennen "teaches forming a lightweight gypsum board" and that this would provide motivation for combining Rennen with Deleuil. Instead, the teaching of Rennen is directed to the problems associated with the use of desulfurization gypsum rather than natural gypsum (see page 6, final paragraph).

Rennen merely mentions at page 5, line 5 that an advantage of conventional gypsum boards is their low weight. This cannot be equated with Rennen teaching forming a lightweight board. In fact, the teaching derived on this point is rather the opposite: since Rennen states that conventional gypsum boards are already lightweight, the skilled person will understand that there is no real requirement for him to direct his energies into obtaining further weight reductions. Therefore, there is no motivation for the skilled person to seek out teaching on weight reduction, whether from Deleuil or any other document.

Specific comments on surface area:

(a) Teaching derived from Rennen

The Examiner considers that Rennen teaches a specific

surface area of $0.2-0.65\text{m}^2/\text{g}$ for the calcined hemihydrate gypsum material, and that it "would have been obvious to utilize this surface area for the dihydrate DSG particles in order to achieve improved water demand and mixing properties prior to discharging the slurry."

This assessment by the Office is based on an incorrect interpretation of the science underlying the preparation of gypsum wallboard. It is clear that the water demand associated with calcium hemihydrate gypsum material will be considerably greater than that associated with calcium sulfate dihydrate particles (in fact, calcium sulfate dihydrate, being a fully hydrated form of the compound, does not contribute significantly to the water demand of the gypsum product).

Thus, considerations of water demand do not apply to dihydrate particles, and so there is no reason why the skilled person should use his knowledge of the behaviour of calcined hemihydrate particles when selecting parameters for dihydrate gypsum particles.

(b) Teaching derived from Deleuil (U.S. 4,221,599)

Deleuil teaches the use of phosphogypsum having a specific Blaine surface between 1000 and 4000 cm^2/g (col. 4, lines 28-30).

Deleuil states the Blaine surface of the gypsum is selected specifically "for the purpose of obtaining a gypsum that is not pasty" and "to insure maintenance of a powdery state for the gypsum." Thus, "use is made of gypsums which are finely divided but which are not ground." (Deleuil col. 4, lines 19-22.)

Rennen does not consider in any way the properties that are required for dihydrate gypsum particles. In particular, it makes no mention of whether the dihydrate gypsum should be pasty or powdery. Therefore, there is no reason why the skilled person should incorporate the surface area disclosed by Deleuil into the teaching gained from Rennen.

Furthermore, Rennen teaches that both the calcined and dihydrate gypsum may be ground (see page 8, line 15 and page 12, final paragraph). Thus, the teaching of Rennen is incompatible with that of Deleuil, which specifically advises against grinding of the gypsum.

Finally, applicants disagree with the Examiner's point that "Deleuil establishes that this surface area is conventionally used and is obviously substitutable for the unspecified area of the Rennen materials." As discussed above, Deleuil teaches that the selection of the surface area is for the specific purpose of obtaining powdery, rather than pasty gypsum, and that this

result depends on the use of finely divided, rather than ground gypsum.

Thus, the teaching that the skilled person would derive from Deleuil is not that this surface area is conventional, but rather that it has been specifically selected for a particular purpose.

Further points of novelty:

Present claims 1 and 13 specify that "the calcium sulfate dihydrate DSG particles comprise an inert particulate filler and thereby improve acoustic properties of the wallboard." While Rennes discloses the addition of FGD dihydrate to the FGD gypsum/water suspension, there is no indication that the dihydrate functions as an inert filler, thereby improving the acoustic properties of the wallboard.

On the contrary, Rennes discloses the use of FGD dihydrate as an accelerator, i.e. actively involved in the setting process (page 12, final paragraph). Furthermore, Rennes explicitly distinguishes FGD dihydrate from inert fillers" such as powdered limestone, fly ash, or vermiculite" (page 12, first paragraph). This Rennes disclosure teaches away from an additive that is a filler and that is inert and thus not active in the setting

process, as applicants claim.

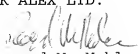
The Office has not provided a reason for combining Rennen with Deleuil in a manner that would arrive at applicants' claimed invention in a manner that complies with Rationale A of the September 1, 2010 PTO "Examination Guidelines Update: Developments in the Obviousness Inquiry After *KSR v. Teleflex*", Guideline A that particularly concerns combining prior art elements. Neither reference teaches predictability of combining these references to arrive at calcium sulfate dihydrate particles having the claimed ranges of surface area and particle size distribution whereby wallboard acoustic properties are improved.

Reconsideration and withdrawal of this §103(a) rejection are respectfully requested with respect to claims 1 and 13 and the claims dependent thereon.

Applicants have made an earnest endeavor to place this application into condition for allowance, and favorable consideration is respectfully requested.

Respectfully submitted,

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